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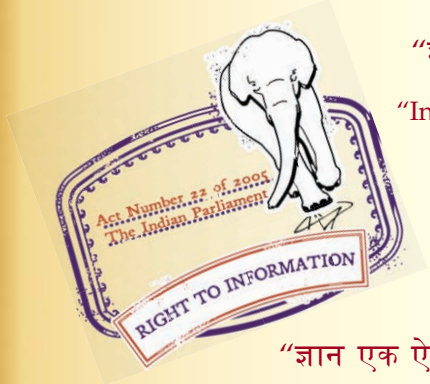
IS 11654-3-404 (1989): Flexible insulating sleeving, Part 3: Specifications for individual types of sleevings, Section 404: Glass textile sleeving coated with acrylic based coating medium breakdown strength [ETD 2: Solid Electrical Insulating Materials and Insulation Systems]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 11654 (Part 3/Sec 404) : 1989
(Reaffirmed 2005)

Indian Standard

SPECIFICATION FOR FLEXIBLE INSULATING SLEEVING

PART 3 SPECIFICATIONS FOR INDIVIDUAL TYPES OF SLEEVINGS

Section 404 Glass Textile Sleeving with Acrylic Based Coating — Medium Breakdown Strength

भारतीय मानक

नम्य विद्युतरोधन स्लीविंग

भाग 3 अलग-अलग स्लीविंग

अनुभाग 404 मध्यम भंजन सामर्थ्य वाली एक्रिलिक आधारित लेपनयुक्त कांच-वस्त्रादि की स्लीविंग

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 1990

Price Group 1

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 23 November 1989, after the draft finalized by the Solid Electrical Insulating Materials Sectional Committee had been approved by the Electrotechnical Division Council.

This standard deals with flexible insulating sleevings. It consists of the following three parts:

Part 1 Definitions and general requirements,

Part 2 Methods of tests, and

Part 3 Individual types of sleevings — Specifications.

This standard (Part 3/Sec 404) covers the requirements for glass textile sleeving coated with acrylic resin medium breakdown strength.

This standard should be read in conjunction with IS 11654 (Part 1) : 1986 'Specification for flexible insulating sleevings: Part 1 Definitions and general requirements' and IS 11654 (Part 2) : 1986 'Specification for flexible insulating sleevings: Part 2 Methods of test'.

In the preparation of this standard, assistance has been derived from IEC Doc 15C (Central Office) 200, Sheet 404 Glass textile sleeving coated with acrylic based coating medium breakdown strength, issued by the International Electrotechnical Commission (IEC).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SPECIFICATION FOR FLEXIBLE INSULATING SLEEVING

PART 3 SPECIFICATIONS FOR INDIVIDUAL TYPES OF SLEEVINGS

Section 404 Glass Textile Sleeving with Acrylic Based Coating — Medium Breakdown Strength

1 SCOPE

1.1 This standard covers the requirements for 'E' type glass sleevings using either braided or knitted construction with a continuous acrylic based coating medium breakdown, temperature index 155.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
11654 (Part 1) : 1986	Flexible insulating sleeving : Part 1 Definitions and general requirements
11654 (Part 2) : 1986	Specification for flexible insulating sleeving: Part 2 Methods of tests
8504 (Part 1) : 1977	Guide for determination of thermal endurance properties of electrical insulating material: Part 1 Temperature indices and thermal endurance properties

3 DESIGNATION

3.1 Sleeving covered in this standard shall be identified as given in **3.1** of IS 11654 (Part 1) : 1986. For example, IS 11654-3-404 Nominal bore size in mm — with suffix 'B' indicates bilateral and 'U' indicates unilateral tolerance indicating type of tolerance — colour code as given in **3.2** of IS 11654 (Part 1) : 1986.

NOTE — In those cases where the designation is required to differentiate between sleeving which is braided and sleeving which is knitted the designation may be worded with suffix as braided or knitted.

For example:

IS 11654-3-404 Nominal bore size in mm — with suffix indicating type of tolerance — colour — braided or knitted.

4 COLOUR AND BORE SIZES

4.1 The sleeving is normally available in bore sizes 0·3 mm to 25 mm and in the following colours:

Black, white, red, yellow, blue, brown, green, green/yellow and natural.

5 REQUIREMENTS

5.1 In addition to the general requirements given in IS 11654 (Part 1) : 1986, requirements specified in this standard shall also be applicable.

5.2 Dimensions

The sleeving shall comply with the dimensional requirements given in Table 1.

Table 1 Dimensional Requirements

Nominal Bore, mm	Tolerance on Bore, Diameter, mm		Wall Thickness, mm	
	Bilateral (±)	Unilateral (+)	*Min*	*Max*
(1)	(2)	(3)	(4)	(5)
0·3	±0·10	0·20	0·20	0·50
0·5	±0·10	0·20	0·20	0·50
0·8	±0·10	0·20	0·20	0·50
1·0	±0·15	0·30	0·20	0·75
1·5	±0·15	0·30	0·20	0·75
2·0	±0·20	0·40	0·20	0·75
2·5	±0·20	0·40	0·20	0·75
3·0	±0·25	0·50	0·20	0·75
4·0	±0·25	0·50	0·30	0·75
5·0	±0·25	0,50	0·30	0·75
6·0	±0·25	0·50	0·30	0·75
8·0	±0·25	1·0	0·30	0·75
10·0	±0·50	1·0	0·40	0·90
12·0	±0·50	1·0	0·40	0·90
16·0	±0·50	1·0	0·40	0·90
20·0	±0·50	1·0	0·40	0·90
25·0	±0·50	1·0	0·40	1·0

NOTE — Only positive tolerance may be used subject to agreement between the supplier and the purchaser but the criterion of nominal bore diameters shall be adopted.

5.3 Bending After Heating

When tested in accordance with **13** of IS 11654 (Part 2) : 1986, there shall be no cracking or detachment of coating, and the original colour shall be clearly recognizable after testing at temperature 180 ± 3°C and mandrel diameters given in Table 2.

5.4 Bending at Low Temperature

When tested in accordance with **14** of IS 11654 (Part 2) : 1986, there shall be no cracking or detachment of coating visible after bending around mandrels shown in Table 2 while at temperature not above — 15°C (Minus 15°C).

Table 2 Mandrel Diameters for Bending Tests
(*Clauses* 5.3 *and* 5.4)

Nominal Bore Diameter, mm	Mandrel Diameters, mm	
	After Heating	At Low Temperature
0·5	3	3
0·8	4	4
1·0	5	5
1·5	6	6
2·0	8	8
2·5	10	10
3·0	12	12
4·0	15	15
5·0	18	18
6·0	21	21
8·0	27	27
10·0	33	6
12·0	40	6
16·0	6	6
20·0	6	6
25·0	6	6

5.5 Resistance to Soldering Heat

When tested in accordance with **7** of IS 11654 (Part 2) : 1986, the sleeving shall not show sign of splitting.

NOTE — This test is applicable for sleeving having nominal bore dia up to and including 5 mm.

5.6 Hydrolysis of Coating

When tested in accordance with **17** of IS 11654 (Part 2) : 1986, there shall be no running off the coating, adherence between sleeving and paper, between the pieces of sleeving or any sign of discolouration of the paper.

5.7 Thermal Endurance

When tested in accordance with IS 8504 (Part 1) : 1977, thermal endurance at 20 000 hours shall be 155 minimum.

5.8 Flammability

When tested in accordance with IS 11654 (Part 2) : 1986, the sleeving shall meet requirement of 60 seconds (Maximum). In addition, the indicator flag on test shall not be burned nor shall flamming or glowing particles ignite the cotton.

5.9 Insulation Resistance

When tested in accordance with **22.4.2** of IS 11654 (Part 2) : 1986, the insulation resistance shall be 10^3M Ω (Minimum).

5.10 Breakdown Voltage

5.10.1 Breakdown voltage shall be determined by any of shot bath test given in **21.2** and straight mandrel test, 25 mm electrode given in **21.2** of IS 11654 (Part 2) : 1986.

5.10.2 The rate of voltage application shall be 500 V/second or such that the required breakdown value is reached between 10 and 20 seconds.

5.10.3 The requirements of breakdown voltage at room temperature, elevated temperature and damp heat when measured in accordance with **21.7** of IS 11654 (Part 2) : 1986, shall be as given in Table 3.

6 PACKAGING

6.1 Provisions of **9.1** of IS 11654 (Part 1) : 1986, shall apply.

7 MARKING

7.1 In addition to the details given in **10** of IS 11654 (Part 1) : 1986, following information shall be labelled:

Construction of the sleeving — braided or knitted.

Table 3 Requirements for Breakdown Voltage
(*Clause* 5.10.3)

	Shot Bath Test Using Straight Mandrel 250 mm Electrode		Straight Mandrel with 25 mm Electrode	
	Central Value (kV)	Lowest Individual Value (kV)	Central Value (kV)	Lowest Individual Value (kV)
Breakdown voltage, kV (*Min*)				
a) at room temperature	3·0	2·5	4·0	2·5
b) at elevated temperature 130°C	2·0	1·5	1·6	1·0
c) after damp heat	1·5	1·2	1·2	0·8

NOTE — The shot bath test shall not be used for sleeving with normal bore diameter above 300 mm.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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